

Application No.: 09/682,076

### **REMARKS/ARGUMENTS**

Upon entry of this response, claims 1-6, 8-23, 25-33 are pending, and of these, claims 1, 18, 27, 32, and 33 are independent. Applicants assert that no new matter is presented by these amendments and respectfully request entry of the same.

The Applicants acknowledge with appreciation, the acceptance of the twelve sheets of formal drawings.

The Applicants have amended the specification to correct the incorporation of subject matter by Attorney Docket Number in the "Cross Reference to Related Applications" Section of page 1, where the newly amended incorporation now includes the appropriate Application Serial Numbers. Applicants respectfully assert that the Application Serial Numbers of the incorporated applications were not available at the time of filing as the incorporated applications and the present application were filed concurrently. Additionally, the Applicants have amended the "Abstract" section of page 33 to correct a typographical error that was made unintentionally.

Also, claims 1, 18, 27, 32, and 33 have been amended for reasons that are discussed in greater detail below. Claims 8, 9, 25, and 26 have also been amended, and claims 7 and 24 are cancelled for consistency with the amendments made with respect to claims 1, 18, 27, 32, and 33.

**Reply to Claim Rejections – 35 U.S.C. §101**

Application No.: 09/682,076

Claim 18 is rejected under 35 USC §101 based upon the Examiners assertion that the claimed invention is directed to non-statutory subject matter and fails to recite any functionally descriptive material.

The Applicants acknowledge with appreciation, and have adopted the Examiners suggestion of amending claim 18 to include the phrase "stored on a computer readable medium". Therefore, the Applicants respectfully assert that newly amended claim 18 complies with 35 USC §101 and is in condition for allowance.

Reply to Claim Rejections – 35 U.S.C. §102(e)

Claims 1-9, 13-28, and 30-33 are rejected under 35 USC §102(e) as being anticipated by Shams (USPN 6,349,144). Shams generally teaches a segmentation method of a frame of image information including a plurality of spaced DNA spot images. In addition Shams describes methods for aligning a grid to the DNA spot images.

The Applicants have amended claims 1, 18, 27, 32, and 33 to incorporate the limitations of receiving one or more user-selected grid aligning parameters, wherein the user-selected grid aligning parameters include an estimated probe feature size; and aligning a grid with a first image based, at least in part, upon the one or more user-selected grid aligning parameters. Support for incorporated limitations may be found in original claims 7, and 24. Additionally, description of user-selected grid aligning parameters may be found in the application on page

Application No.: 09/682,076

31, line 7 *et seq.*, as well as description of estimated probe feature size that may be found in the application on page 32, line 16 *et seq.*

With respect to newly amended claim1, the Applicants assert that Shams does not disclose the limitations of user-selected grid aligning parameters that includes an estimated probe feature size.

The Examiner asserts in the rejection of claims 7 and 24 that Shams teaches user-selected grid aligning parameters and points to the description in Shams at col. 11, lines 23-27 that states:

"The grid position determined in steps described above can be applied, with any user defined translation or transformation, to the non-control image to quantify expression values according to the quantification methods described above."

The Applicants respectfully assert that Col. 11, lines 23-27 does not disclose the limitations of user-selected grid aligning parameters used for aligning a grid to the first image, where the grid aligning parameters includes an estimated probe feature size. The Applicants assert that the disclosure of Col. 11, lines 23-27 lacks the grid aligning parameters used for aligning a grid to the first image, as well as the grid aligning parameters including an estimated probe feature size. For example, Col.11, lines 23-27 of Shams describes positioning a grid on the non-control image with a user defined translation or transformation of the grid position determined from placing the grid on the control image. In other words, employing the user defined parameters when aligning the grid position to the second image based upon the alignment of the grid to the first image.

Application No.: 09/682,076

However, the Applicants would like to reiterate the discussion presented in the personal interview conducted on July 20, 2004, and direct the Examiners attention to Col. 6, lines 6-9, and lines 15-19 of Shams that states:

Lines 6-9:

"The user then selects an image region 18 in the control image 12 by defining approximate four corners 42 of the image region 18 using the input device 38."

Lines 15-19:

"The user then specifies the number of columns, C, and rows, R, of arrayed image spots 10 in the selected region 18. The computer 34 then automatically generates the grid 22 with equal spacing between each pair of corners having R rows and C columns within the specified region 18."

The Applicants respectfully assert that the disclosure in Shams Col. 6, lines 6-9, and lines 15-19 does not include an estimated probe feature size. Rather the only relative measure provided in Shams is the disclosure of a grid with equal spacing, that the Applicants assert is not the equivalent of or inherently includes a user selected estimation of probe feature size. For example, a grid with equal spacing not only encompasses the size of a probe feature but also includes what is referred to as inter-feature spacing that can be variable between embodiments. Inter-feature spacing includes areas between probe features that have no associated probes or labels, and may be implemented for various reasons including the ability to distinguish individual probe features from one another and/or allow for a degree of variability of probe feature sizes. Therefore, the actual size of a probe feature cannot be directly inferred from the area bounded by

Application No.: 09/682,076

grid lines due to the variable nature of inter-feature spacing, and further has no implication of a user-selection of an estimation of probe feature size.

The Examiner further asserts that Col. 5, lines 27-37 describes an estimated feature size in the rejection of claims 9 and 26. Shams col. 5, lines 27-37 states:

"In one embodiment, the present invention provides a method for automatically locating an array of DNA spot images 10 within a scanned image frame 12 of a DNA micro-array or a DNA macro-array, shown in FIGS. 1 and 2, wherein each spot corresponds to a particular gene or gene fragment. The method of the present invention is applicable to both high-density micro-arrays, where spots are closely packed together on a solid surface, such as glass, with several thousands of spots placed in about 1 cm square area, and to macro-arrays with larger spacing of spots on surfaces such as membrane surfaces."

The Applicants respectfully disagree with the Examiner, and assert that the above disclosure does not include a description of user-selected grid aligning parameters that includes an estimated probe feature size used for aligning a grid to an image. In fact there is no description of any measure of size of the probe features, rather just a generalized description of a possible number of spots within a 1cm area.

Shams further discloses in Col. 2, line 37-41:

"Therefore, as shown in Figure 2, not only are the DNA spots occasionally placed out of the regular grid pattern, but they also vary in size. It is therefore rare to have a fixed grid that that can match exactly the pattern in the micro-array."

The above description not only does not disclose a user-selection of an estimation of probe feature size that may be used as a grid aligning parameter, but

Application No.: 09/682,076

also infers that variation in probe feature size causes spots to be outside of the regions defined by the areas bounded by the aligned grid, and thus argues against the size of a probe feature as inherent to, or made obvious by the area defined by a grid.

Therefore, the Applicants respectfully assert that claim 1 is patentable. Further, the Applicants assert that claims 18, 27, 32, and 33 are similarly amended and are thus patentable for the same reasons.

The Applicants also assert that claims 2-6, 8-17, 19-23, 25-26, and 28-31 each depend from claims 1, 18, or 27 in their respective chains of dependency and are thus patentable for the same reasons.

Reply to Claim Rejections – 35 U.S.C. §103(a)

Claims 10-12 and 29 are rejected under 35 USC §103(a) as being unpatentable over Shams as applied to Claims 1, and 27, in view of Ramm et al. (USPN 6,345,115).

The Applicants respectfully assert that independent claims 1 and 27 as amended are not anticipated by Shams for the reasons described above, and are therefore patentable. Therefore, the Applicants assert that claims 10-12 and 29 are not obvious under 35 USC §103(a), and the rejection should be withdrawn.

Further, the Applicants respectfully disagree with the Examiners assertion that Ramm et al. discloses capturing two images in parallel with two excitation beams. The Examiner points to Col. 3, lines 26-43 for support that states:

Application No.: 09/682,076

"An area imaging system places the entire specimen onto a detector plane at one time. There is no need to move PMTs or to scan a laser, because the camera images the entire specimen onto many small detector elements (usually CCDs), in parallel. The parallel acquisition phase is followed by a reading out of the entire image from the detector. Readout is a serial process, but is relatively fast, with rates ranging from thousands to millions of pixels/second.

Area imaging systems offer some very attractive potential advantages:

1. Because the entire specimen is imaged at once, the detection process can be very quick.
2. It is relatively easy to acquire a timed series of images for dynamic assays.
3. Given an appropriate illumination system, any excitation wavelength can be applied.
4. Luminescence reactions (bioluminescence, chemiluminescence) can be imaged.
5. Free or fixed format specimens can be imaged."

The Applicants respectfully assert that the disclosure in Ramm et al. refers to multiple detector elements (using CCDs as an example) capturing a single image in parallel. For example, Ramm discloses a camera that images the entire specimen onto many small detector elements in parallel rather than scanning a laser across the specimen and serially collecting image data. Further, Ramm et al. specifically states that the "parallel acquisition phase is followed by reading out of the entire image from the detector". Thus, the disclosure in Ramm et al. only describes that capture of a single image.

The Applicants also respectfully assert that there is no disclosure of two excitation beams, rather a general statement that "any excitation wavelength may be applied", where the term "wavelength" is in the singular referring to one wavelength that is not restricted to be in a certain range of wavelengths.

Application No.: 09/682,076

### CONCLUSION


For these reasons, Applicants believe all pending claims are now in condition for allowance. If the Examiner has any questions pertaining to this application or feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (781) 280-1522.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account 01-0431.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

By



William R. McCarthy III Reg. No.: 55,788

Customer No.: 22886  
Legal Department  
Affymetrix, Inc.  
3380 Central Expressway  
Santa Clara, CA 95051  
Tel: 781/280-1522  
Fax: 781/687-9090